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GOLD CREEK FISH PASSAGE STRUCTURE

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I. INTRODUCTION

Timber access road construction has often failed to adequately provide for or consider the spawning needs of anadromous fish (BLM Manual 5110). As a result metal culverts often blocked fish passage when installed with the lower end too high above the stream (BLM Manual 6760). One solution to this problem is discussed here.

II. BACKGROUND

A culvert installation on Gold Creek, a tributary of the West Fork of Smith River, was identified as a fish passage problem. The culvert was improperly placed when the West Fork of Smith River Access Road was constructed. The road is a mainline, hard surface road paralleling the West Fork Smith River and crossing the mouth of Gold Creek. It was estimated that it would cost $10,000 to remove and lower the culvert to an acceptable level for upstream fish passage.

The North Area Manager and District Engineer, Coos Bay District, and Oregon Game Commission employees suggested that concrete sills be installed in the river a few yards downstream from the culvert (Illustration 1). The water level of the West Fork would then be raised to the height of the culvert making it permanently passable by upstream migrating fish. The Bureau of Land Management and the Oregon State Game Commission cooperated in constructing such a facility in the summer of 1969 at a total cost of $2,058.

III. DESCRIPTION

The two dams used to raise the water level in the West Fork were made of ready-mixed concrete secured with reinforcing steel to the river bedrock. Each dam is approximately 18 inches to 24 inches high and has a water concentrating notch in the center. The low height of the dams provides easy upstream passage for anadromous species.

The exact details of the installation are not presented here as each sill requires individual design to conform with the stream conformation. The complete details of the installation are not presented because each structure requires individual design to meet site hydrologic and foundation conditions. Concrete sills are statisfactory on a bedrock base, but more flexible material, such as "Gabions" (BLM Manual 6760) may be superior on a less firm stream bottom. The type of installation and materials used should be properly engineered and then the design coordinated with a Fishery Biologist.

The possibility of log jams forming on or against the structures was considered. Because of the low profile of the structures, the possibility of collecting debris is remote. The structures must be inspected and periodically maintained to insure maximum effectiveness.

Only when freshets are subsiding can debris lodge on the dams. No large logs are floating downstream at this time as the stream is too shallow. Material that does lodge against the dam can be readily removed or the succeeding freshets will wash it downstream.

IV. EVALUATION

The success of the installation is worthy of discussion. It has the possibility of being used as a model in many similar situations.

Steelhead trout have been observed during the winter of 1970 using the pools created by the two dams as resting areas -- (Illustrations 1 and 2). A bar of spawning gravel developed on a former bedrock area below the lower dam and was used by steelhead trout for spawning. The new spawning area was created by the construction of the dams.

Some gravel has been deposited in the lower pool and a larger bar is developing on the bank opposite the mouth of the culvert. The size of the gravel bars in the pools appears to be increasing. It is possible the pools may become filled with enough gravel to serve as fish spawning beds. Several more winters of observation will be required to assess the extent of the gravel deposition and also to evaluate the fishes acceptance for spawning.

V. SUMMARY

Although the Gold Creek fish passage structure has been operational for less than a year, it appears to be a successful solution to a common problem because:

(1) It provides good fish passage through the culvert at all levels of flow.

(2) It has created fish habitat in the form of pool area where none previously existed.

(3) It has increased the available spawning area of the stream by creating a new gravel bar.

(4) It is structurally sound and has not caused any new problems.

(5) It solved a fish migration problem at a lower cost and the inconvenience of reinstalling the culvert.

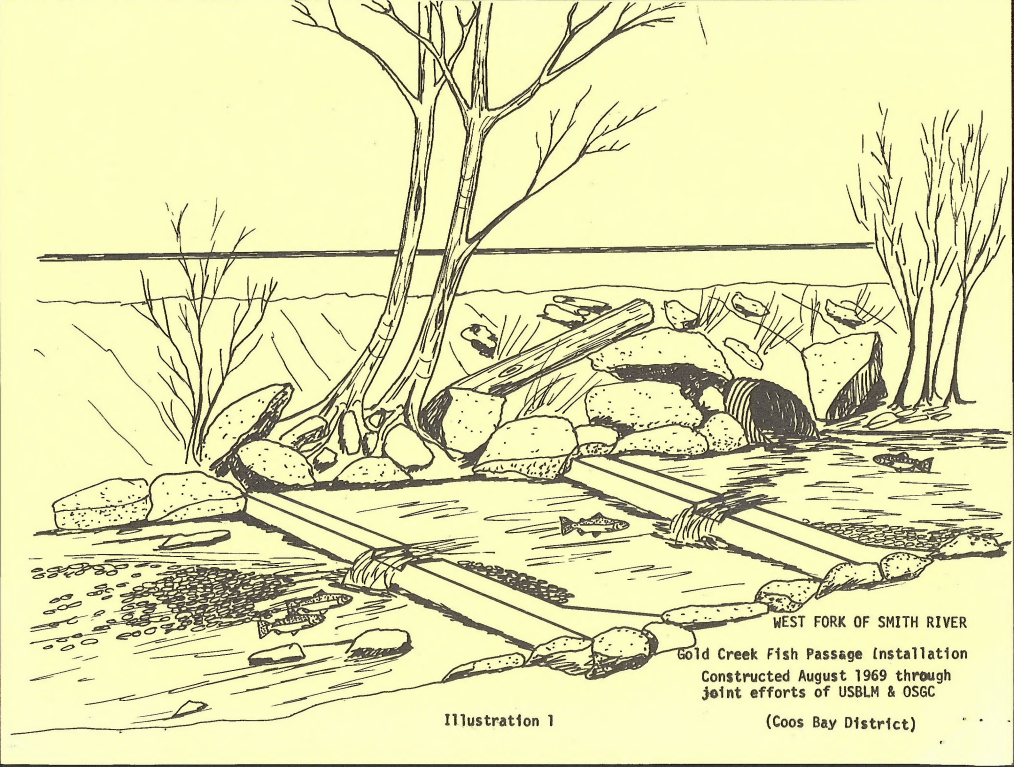
REFERENCES

Bureau of Land Management. Manual 5110 - Stream Protection. 1969. 11 p.

Bureau of Land Management. Manual 6760 - Stream Preservation and Improvement. 1968. 49 p.

Design by Oregon State Game Commission, Engineering Division, Portland, Oregon.

Oregon Revised Statutes. Stream Obstructions. 509.605.



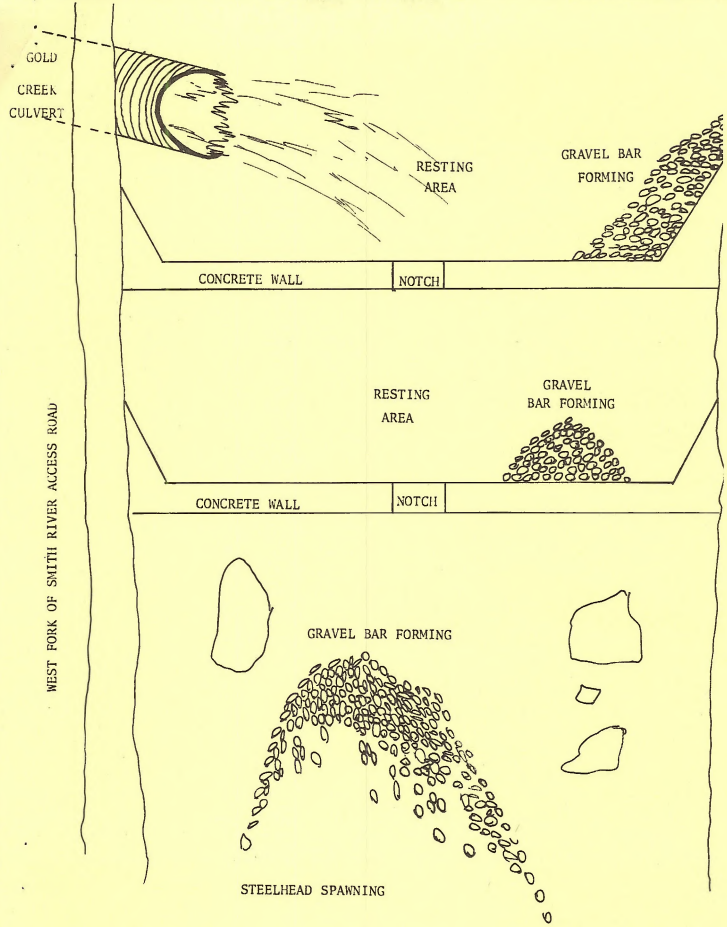
WEST FORK OF SMITH RIVER

Gold Creek Fish Passage Installation

Constructed August 1969 through
joint efforts of USBLM & OSGC

Illustration 1

(Coos Bay District)



- ILLUSTRATION 2 -

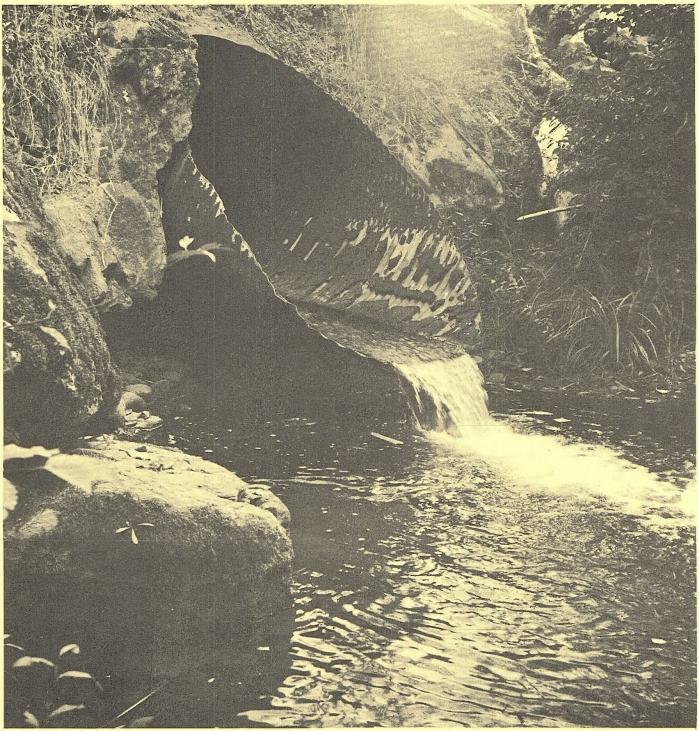


Illustration 3 - GOLD CREEK - Culvert outlet before dams were built. Overhang prevented passage of salmon and steelhead.

Illustration 4 - View of West Branch of Smith River after dams were completed. Form iron was removed after photograph was taken.

Illustration 5 - GOLD CREEK - Culvert outlet after dams were built.